INNOVATION IN SKILLED TRADES TRAINING AND APPRENTICESHIP IN BC

Inventory of innovation

Funding provided through the Canada-British Columbia Labour Market Development Agreement.
INTRODUCTION

In British Columbia, we have an incredible opportunity on the horizon. The provincial government’s B.C.’s Skills for Jobs Blueprint: Re-Engineering Education and Training, supports efforts to continually explore and develop new and innovative ways to make trades training work better, especially through stronger partnerships with industry, labour and training providers, so BC students and workers are first in line for the jobs in the growing economy.

In 2014-15, the Industry Training Authority (ITA) and the provincial government worked together to collect nearly 100 examples of innovative practices in use in the BC trades training system, helping improve trades training outcomes. Substantive work is underway in all regions across the province. This report summarizes a few examples of innovative practices involving flexible delivery, regional access, student supports and partnerships.
FLEXIBLE DELIVERY

Deliver technical training through flexible scheduling and use of innovative tools to attract apprentices and encourage program completion.

- CCT Controls developed an on-site training centre to supplement the technical training their apprentices receive. This training develops apprentices into specialized tradespeople to meet the needs of CCT’s customers. CCT also established a competency measurement tool for Construction Electrician and Instrumentation and Control Technician apprentices. This tool, which builds practical skill sets essential for CCT’s specialized work and equipment, also allows CCT to track and document progress and fill in training gaps.

ACCELERATED TRAINING PERIODS

- By increasing the hours taught each day, the College of New Caledonia has shortened each level of Machinist technical training from six weeks to five weeks. Although students are in class for longer each day, they finish their program one week sooner. This approach helps to attract students to the Machinist apprenticeship program, particularly students coming from other areas of the province, and companies are pleased that their apprentices can be back at work a week earlier.

APPRENTICESHIP TRAINING ON A WEEKLY BASIS

- The BC Wall and Ceiling Association delivers technical training for Wall and Ceiling Installer. Instruction is delivered on Thursday evenings and all day Fridays and Saturdays (20 hours/week). Apprentices can continue to work part-time or full-time while attending school.

Technical training is delivered in Surrey at the BC Wall and Ceiling Association office and regionally through partnerships with training providers in the Greater Victoria area.

- White Spot selects a cohort of apprentices to take Professional Cook 1, 2 and 3 technical training one day per week over 25 weeks at Vancouver Community College while continuing to work full-time. There is no reduction in training time.

The Quadrant Marine Institute, which was developed by the marine repair industry, delivers Marine Service Technician technical training once per week in the evenings. This timing results in no lost wages for the apprentice, no lost time for the employer, and no Employment Insurance costs while apprentices participate in the training.
At the British Columbia Institute of Technology, 3-D applications allow a mechanical system or object to be viewed from, and rotated in, all directions. While these applications have been used in machining and manufacturing trades for some time, they are now also being used to train tradespeople on complex mechanical systems. BCIT uses 3-D applications for Aircraft Maintenance training, Carpentry trades training and other technical training.

**DELIVERING MULTIPLE LEVELS IN ONE CLASS**

- Northern Lights College delivers Welder training to all three levels in one class. This enables a smaller group of apprentices to progress towards certification.

**DELIVERING ONLINE AND BLENDED LEARNING**

- The first year of the BC Funeral Association’s Foundation program is provided through in-class and online training. To continue into the second year of training, students must find employment with a funeral service provider within two years.
- Camosun College’s Professional Cook 1 and 2 technical training is delivered online over five to six months, as compared to over six weeks in the traditional program. This allows apprentices to stay at work while learning at the same time. Employers have online access to all course materials and the completion schedule. Formative assessments are done online while summative assessments (written and practical) are completed face-to-face.
- During the first two levels of the Recreation Vehicle Service Technician apprenticeship program at Okanagan College, safety and other generic topics are delivered via online training, with a practical portion done on-site at the College. For the first year, the format is three weeks online and five weeks on-site, and the second year is two weeks online and six weeks on-site. In the third year, the format is eight weeks on-site, with no online component. In the initial delivery of an online format, the College had included online instruction in all three years; however, they found that there was a drop in the IP pass rates because online training did not work well in the third year due to an increased technical focus. The issue was corrected by removing the online portion and using only on-site instruction for the third year, and the IP pass rates have returned to their previous levels.
- Camosun College delivers a Piping Trades Foundation program using digital learning tools within a classroom setting. The digital approach has been found to enhance learning.
- Vancouver Community College’s Automotive Service Technician program is delivered through three months of online training and one week in class. These flexible learning offerings give apprentices more options, allowing them to complete their training sooner and avoid having to take as much time off work.
- Okanagan College developed a library for Electrical Foundation and apprentice students with videos that demonstrate how to use tools, bend conduit, etc. The series focuses on all practical aspects of the Electrical trade. Students can use the videos in their own time to enhance their learning, which has led to improved student success and learning retention.
- Okanagan College uses Moodle as a companion course site for apprentices in face-to-face programs, providing them with practice exams and course materials. Although this requires some time for the apprentices to understand the practical assessments and for instructors to complete the assessments, instructors feel that the tools have helped apprentices succeed.
- BC Hydro partnered with the College of New Caledonia (CNC), a BC Hydro educational partner, to provide the online Electric Utility Fundamentals course to students in the Power Line Technician, Millwright and Machinist programs. This course supplements the theory required to understand and explain the systems that generate and deliver electrical power. Apprentices have access to a CNC tutor to help with course-related questions.

Vancouver Community College’s Auto Collision and Baking instructors use social media and electronic tools for teaching. This makes better use of off-campus time and focuses face-to-face instruction on hands-on activities. Instructors use the “flipped classroom” model, directing students to first watch videos and do simple exercises on their own, and then come to school the next day and use those exercises while doing the hands-on work. Students also blog about their reflective writing, portfolio and capstone research project, although blogging has proven to be a challenging technology for some to adopt.
VIRTUAL TOOLS IN THE CLASSROOM

• Okanagan College was the first school in western Canada to acquire a virtual reality arc welding simulator. The VRTEXT360, made by the Lincoln Electric Company, reduces the amount of material used to train Welders.

• Thompson Rivers University accepted a donation of $373,000 from Great West Equipment to provide simulation equipment for new Heavy Equipment Operator training programs. The machine simulator, which provides hand-eye coordination exercises and helps develop muscle memory for basic machine tasks, is also used as an assessment tool for those who are applying to enter the program. Simulators provide a safe way to train students in equipment operation while reducing maintenance costs.

• Okanagan College invested in a Virtual Reality Paint simulator that has proved to be a great asset in training Automotive Refinishing Technicians to be more productive and material conscious. With the paint trainer, students aim a virtual paint gun at a white screen while a computer records the speed, amount and coverage of paint.

• BC Hydro uses a 3-D applications tool to allow Power Line Technician apprentices to build, test, troubleshoot and simulate actual work on reclosers, voltage regulators and transformers. Apprentices can build transformer banks on a safe virtual distribution line, communicate set-ups and builds to an instructor for feedback, and practice complex work procedures using the 3-D simulation in the classroom, prior to the practical application of the skills in the training line yard.

At the British Columbia Institute of Technology (BCIT), 3-D applications allow a mechanical system or object to be viewed from, and rotated in, all directions. While these applications have been used in machining and manufacturing trades for some time, they are now also being used to train tradespeople on complex mechanical systems. BCIT uses 3-D applications for Aircraft Maintenance training, Carpentry trades training and other technical training.
Introduction of training models that break down barriers to accessing trades training by bringing training opportunities to apprentices in remote areas across BC.

- Selkirk College transported equipment from their Nelson campus to two smaller communities to deliver Carpentry ACE IT and Foundation programs. One program, delivered in Nakusp, was made possible by a partnership with School District 10 and the Village of Nakusp, with partial funding from BC Hydro. Training was delivered at the Selkirk College site, the secondary school, and in an adjacent parking lot and field. A second program was delivered at a secondary school in Grand Forks with School District 56.

- Thompson Rivers University (TRU) has a 53-foot custom-built long-box trailer with pull-out sides that is equipped to hold 12 Welding stations. Hauled by a semi-truck and fully self-contained with its own generator, the unit can run for up to a month in a remote area on its own fuel. By running two classes at the same time (e.g., an 8:00 a.m. – 3:00 p.m. class and a 3:00 p.m. – 10:00 p.m. class), the unit could accommodate up to 48 students per year.

- Northwest Community College (NWCC) and Kitimat Valley Institute have partnered to deliver Construction Craft Worker training in Terrace, thanks to ITA funding. Construction and Specialized Workers’ Union members coming off Rio Tinto’s Kitimat Modernization Project are expected to benefit from this training, as substantial demand for Construction Craft Workers is projected by industry.
TAKING TRAINING TO THE WORK SITE

• The Christian Labour Association of Canada created a virtual classroom system in order to bring training to remote areas and to First Nations across BC. Through the training centre, students at remote job sites and in communities across BC are linked to instructors at Thompson Rivers University (TRU) using a combination of GoToMeeting, Skype and online learning with recording capabilities. In partnership with Ledcor, TRU used the system to teach Construction Craft Worker skills to Haisla First Nations students at a Chevron site in Kitimat. The theory portion of technical training was delivered online at the work site each morning over four weeks, with students returning to work each afternoon. Following the theory portion, a TRU instructor delivered the practical training component at the work site.

TAKING TRAINING TO CORRECTIONAL FACILITIES

• In partnership with Correctional Service Canada, Camosun College delivered trades training in Professional Cook 1 and Electrical at a correctional facility. Each program had unique attributes: Professional Cook was production-based and Electrical was self-paced. All three programs provided offenders with an opportunity to develop employment ready-skills and to achieve recognized industry certifications prior to their release from the facility.
Offer programs to apprentices that build upon essential skills and cultural knowledge to support employment success and retention.

- Aboriginal Community Employment Services Society (ACCESS) offers a range of Essential Skills programs to support employment success and retention. The Employer Partner program is an eight-week program that builds targeted foundational workplace Essential Skills identified for specific employment positions. Learners engage in a guided program where they identify their skill gaps and work on essential skills activities to elevate competency and support their training and/or employment goals. A four- to eight-week Essential Skills upgrading focus is also built into their Metal Fabrication, Machinist, Electrical, Piping, Transportation, and Welding Foundation programs.

- Vancouver Island University integrated additional adult basic education supports into their Welding program to improve overall success with technical training.

- Okanagan College delivers Essential Skills upgrading training to students from the Penticton Indian Band prior to their entry into Residential Construction Program. The program supports improved student outcomes and employability for First Nations students.

CULTURAL DIVERSITY

- The Piping Opportunities for Women program is offered by the UA Piping Industry College of BC (UAPIC) to assist women wishing to pursue a career in the piping trades. This six-week program offers opportunities for women with minimal or no experience in piping to explore options available such as Plumbing, Steamfitting, Sprinkler Fitting and Welding. Program participants have the option to proceed with Foundation training or to access specialized Welding training through UAPIC. Supports provided are determined through an assessment process, based on the needs of an applicant, and could include free tuition, daycare subsidies, subsidized lunches/meals, safety boots and coveralls, monthly gym memberships, and math tutoring.

Developed in consultation with coastal First Nations communities, this Vancouver Island University construction program is designed for Aboriginal learners. Components include recognition of cultural issues regarding education and traditional construction as well as skills development in areas such as mathematics and communications.
Increase the availability of resources through innovative partnerships between institutions, training providers, industry, employers, charities and communities.

**PROVIDING ACCESS TO EQUIPMENT**


**INCORPORATING WORK EXPERIENCES**

- Northern Lights College has integrated a practicum placement into their Foundation program. The practicum is supervised and evaluated by faculty at Northern Lights College and by the employer. In order to begin a practicum, students must complete or show current valid certification for safety courses such as Occupational First Aid, WHMIS and H2S Alive. Practicum length varies by trade from 40 to 160 hours. Students must keep a detailed written report or logbook of their work, and submit it to the instructor upon completion of the practicum.

- In partnership with training providers (Thompson Rivers University, Selkirk College and School District 67), the Southern Interior Construction Association offers pre-trades training throughout the Southern Interior. The 19-week industry-driven program exposes students to Carpentry, Electrical and Plumbing, reflecting the skills that employers are seeking. Training consists of 50 percent theory and 50 percent hands-on projects. As part of the program, students are matched with an employer for a practicum placement that could potentially lead to employment.

For the mechanical and equipment module of their Level 1 & 2 Horticulture program, School District 41 rents machinery from industry partners West Coast Lawns and Able Tool Rentals. The equipment is delivered to the training site and then picked up after the module. Community & Continuing Education Services is pursuing a partnership with their School District to use District grounds maintenance equipment instead.
COMMUNITY PARTNERSHIPS

- Okanagan College students in Carpentry Foundation move from the classroom to the job site to participate in building projects through the Home for Learning program in Kelowna, Penticton, Vernon, Salmon Arm, or Revelstoke. At the outset of the program, the Home for Learning partnership only built homes to be sold, with proceeds given back to the College Foundation. However, at one point, the College and its partners were left with an unsold house for a number of years, so the model was changed to include not-for-profit projects benefiting charitable groups such as daycare facilities, women’s shelters, and Habitat for Humanity.

- Vancouver Island University has partnered with Habitat for Humanity and surrounding First Nations to take a local house to the lock-up stage, providing an industrial setting for practical learning for Carpentry.

- Through Coldstream Truck Parts, the Salt family has donated a number of vehicles and parts to Okanagan College. Most recently, the family-owned company donated a Caterpillar IT18F front-end loader worth approximately $60,000. This provides students in the Heavy Duty Mechanics program with hands-on training experience on a common piece of equipment in the industry. The motivation for donating the loader was simple: the family believes that the community needs to support up-and-coming tradespeople.

- The North Island Hospitals Project and Tandem Health Partners have been working with the Province of BC, the ITA, local School Districts, North Island College, the North Vancouver Island Aboriginal Training Society, local employment foundations, and others to develop apprenticeship and other training programs and employment opportunities. Planning for two new northern Vancouver Island hospitals is aiming to maximize the number of apprenticeships. Six community groups are working with the Project Officers and Graham Construction to line up apprenticeship programs with the needs of the project’s contractors and sub-contractors, expected to create 1,900 direct jobs for 145 trades. Community groups include North Island College, North Island Employment Foundation Society, North Vancouver Island Aboriginal Training Society, Skills Training Employment Program, and School Districts 71 and 72.

SHARING DELIVERY BETWEEN TRAINING PROVIDERS

- Two very different BC secondary schools – one in Houston with a small and declining enrolment, and one in Smithers with a large student population – are 80.5 km apart. The school in Houston had available space to accommodate training; however, the larger student population was located in Smithers. Officials from School District 54 and Northwest Community College (NWCC) met with regional industry representatives to discuss the possibility of delivering training in Houston for Smithers students. In partnership, School District 54, NWCC, Monster Industries and Canfor, revamped the closed-down auto shop at Houston Secondary School into a great teaching space for Millwrights. The new shop has brand-new lathes, welding tables and a CNC milling machine.

Camosun College has partnered with several charities over the years on construction projects. The most recent partnership was formed in 2014 with Habitat for Humanity Victoria to build the concrete foundation and structural framing for a fourplex of row housing. This provides a real-world environment in which learners can apply their new Carpentry knowledge on an actual job site.
• Through a partnership with Northern Lights College, Okanagan College was able to bring Aircraft Maintenance Training to the Okanagan region. Northern Lights College delivers the first 48 weeks of this 62-week program at the Okanagan College Aerospace Campus in Vernon, with the remaining 14 weeks taking place at Northern Lights College in Dawson Creek. Graduates are granted a diploma in Aircraft Maintenance Engineering from Northern Lights College. Okanagan College invested approximately $300,000 to construct the Aerospace Campus, and continues to supply student recruiting and administration. Northern Lights College contributes their Transport Canada Approved program along with curriculum and staff. Vernon students have guaranteed housing at the Northern Lights College apartment complex on campus.

• Okanagan College formed a partnership with Taylor Pro Training, a leader in truck driver training, to offer Class 1 Truck Driver training and Heavy Equipment Operator training. Although the driving school is located in Kelowna, as is the main Okanagan College campus, Taylor Pro delivers training with their equipment and instructors at Okanagan College campuses throughout the region, including Penticton, Salmon Arm, Revelstoke and Vernon.

A new 142,000 square-foot Motive Power Centre of Excellence on Annacis Island replaced smaller outdated facilities at Vancouver Community College and BCIT. The two schools share common space, including labs/classrooms, work areas, locker rooms, and shop space. Heavy Duty Equipment Technicians, Transport Trailer Technicians, Diesel and Commercial Transport Mechanics, Railway Conductors and Forklift Operators will all be trained at the new centre.